City of Newport Beach
Water Quality/Coastal Tidelands Committee Minutes

Date: May 9, 2013
Time: 3:00 p.m.
Location: Crystal Cove Conference Room

1. **Welcome/Self Introductions**
   Committee Members present:
   Chairwoman/Council Member Nancy Gardner
   Dennis Baker
   Carl Cassidy
   Fred Galluccio
   George Robertson
   Laird Hayes
   Tom Houston
   Lou Denger

   Guests present:
   Jack and Nancy Skinner, SPON
   Jim Mosher, resident
   George Drayton, resident
   Monica Mazur
   Donna Ferguson
   Jenna Voss, OC Public Works
   Kimberly Buss, OC Public Works
   Patrick Bauer, City of Costa Mesa
   Shalini Nair

   Staff present:
   John Kappeler, Water Quality Manager
   Bob Stein, Assistant City Engineer
   Shane Burckle, Water Conservation Coordinator
   Shari Rooks, Public Works Specialist

   The agenda for the Water Quality/Coastal Tidelands Committee was posted at 10:40 am on May 8, 2013, on the City Hall Bulletin Board located in the entrance of the Council Chambers at 100 Civic Center Drive.

2. **Approval of Previous Meeting's Minutes**
   The minutes from the April 11, 2013 meeting were approved with minor revisions.

3. **Old Business**
   A. **Bay and Ocean Bacteriological Test Results**
   Monica Mazur reviewed recent water quality test results within Newport Bay and along the ocean shoreline.

   B. **Bob Stein** gave the Committee an update on the various Total Maximum Daily Loads (TMDLs) for Newport Bay so the Committee could determine which TMDL(s) they felt they should prioritize.
   - Sediment – we are very close to meeting this TMDL and continue to work with stakeholders to reduce the amount of sediments reaching the bay.

- Selenium – the work plan for Big Canyon is underway with implementation of a project that will start this year for diversion of some hot spots with a potential project next year of dredging some "hot" sediment. The upstream stakeholders are still working on their work plan and appear to be making some progress.
- Fecal Indicator Bacteria (FIB) – these requirements have been met in the harbor with the exception of the "Arches" drain. There are exceedences in the Upper Bay and the creeks. Stakeholders have agreed to proposed revisions to the TMDL that would allow for natural source exclusion.
- Nutrients – levels are significantly reduced, although the Regional Board is considering lowering targets to reduce algae blooms in San Diego Creek. **Jack Skinner** noted that when the Regional Board initiates the selenium TMDL flow control the nitrate levels will automatically be lowered.
- Organochlorine Compounds (OC) - this TMDL has been on the back burner for years until now and it is being actively considered because it has been approved and amended by the State Board. There will be an important discussion by stakeholders as to how to proceed. **Nancy Gardner** stated that the City should not be held to a standard if the state is not going to ban products.
- Copper - there is no current copper TMDL although the Regional Board seems set to promulgate one on the Newport Bay watershed focused on eliminating copper boat paint. City recommends additional studies to determine if copper loads really pose a threat, and if copper is a threat the City feels it should be a state-wide regulation, not just for Newport Beach. **Nancy Gardner** asked if a study had been performed since the dredging of the Rhine Channel and there has not been.
- Trash – there have been indications that there may be a future trash TMDL. Should we be proactive with upstream neighbors to put some trash collection facilities in the Delhi Channel and San Diego Creek to catch storm flows so the City would not have to collect the trash in the bay?
- NPDES Stormwater Permit – We are nearing the end of the current five-year term permit. Before the expiration of the permit the stakeholders have an opportunity to write a report to the Regional Board with their recommended changes to the permit. (Data will be collected from cities at the end of June and then it is "crunch time" beginning in July).

ACTION: Nancy Gardner suggested that the Harbor Commission do a presentation on copper for the WQ/CT Committee because they look at it from a boater's prospective rather than a water quality prospective.

4. **New Business**

John Kappeler gave a presentation and overview of the proposed **"Arches" Water Quality Improvement Project.** (See attached presentation)

- The Arches location is currently the only one in lower Newport Bay not meeting Fecal Coliform TMDL standards. The Arches Bridge is one of the Committee's priorities – the drains and the exceedences we've had there.
- The watershed area is approximately 560 – 600 acres and drains a bit of Newport a lot of Costa Mesa and a good bit of Caltrans Right-of-Way.
- We previously did 2 weeks of flow monitoring and sampling for all three indicators (total coliform, fecal coliform and enterococcus).

- Flow results from the V-ditch – averaged 30,000 gal/day.
- Total coliform averaged 15,000 units/100ml (the limit is 10,000), fecal coliform was 1000 units/100ml (the limit is 400) and enterococcus was 547 units/100ml (the limit is 104).
- The BMPs we've put in place include the bioswale, the 2 Continuous Deflection Separator (CDS) Units, and Costa Mesa screened all of their 115 catch basins and they also have a new project planned for Lions Park (Detention Basin).
- Low Impact Development (LID) has also helped to improve the watershed and Costa Mesa's efforts were described in detail by **Patrick Bauer**.
- **Dennis Baker** asked if there was any possibility of re-directing the flow from the West Side of Costa Mesa away from Newport Bay.
- **Nancy Gardner** asked if we could test the water in the pipe upstream of the bioswale.

ACTION: Ask Council for funding to design a study that would focus on sampling the Arches storm drain outfall and look at the biofilm, other bacterial sources related to the marina, the pump out station, the time of day and the phase of the tides when we took samples and try to determine if this area really is the source of the problem. Next if the outfall area is ruled out, move upstream and look at the swale and the CDS units as possible sources of biofilm.

5. **Kimberly Buss** and **Jenna Voss** from OC Public Works gave a presentation of their **"Proposed Countywide Adopt a Channel Program."** (See attached presentation)
   - Disneyland Resort approached OC Public Works in July 2010 and asked to adopt a segment of the Anaheim-Barber City Channel and in August 2012 trash and graffiti removal began.
   - Municipal activities related to the Adopt a Channel Program include: litter enforcement, street sweeping, catch basin and channel cleaning, graffiti removal, booms, screens and other structural devices.
   - Adoption prototypes: Corporate adoption of a channel using the current pilot program format or non-profit/volunteer-based adoption of a concrete-lined channel or an earthen-bottom channel.
   - Potential Program Marketing Advantages: Earned media potential working with local media outlets; link from OC Stormwater web pages and social media to highlight stewardship; website linking with the County, OC Stormwater and adopting organizations.
   - They have identified over 120 miles of concrete-lined channels available for adoption in the county and are working on identifying the earthen-lined channels available.
   - OC Public Works is currently working on program signage and iconography.
   - **Tom Houston** asked about using trustees or high school students interested in earning work credits for labor. The OC Public Works used to have inmate labor for graffiti abatement, however they are no longer able to use trustees.
   - **Dennis Baker** suggested the premier location for program advertising would be across the top of the trash booms.
   - **Jack Skinner** pointed out the most important thing to consider when cleaning the Delhi channel is to be sure to do it in the spring and definitely before the first storm flow in the fall.

5. **Public Comments on Non-Agenda Items**

6. **Topics for Future Agendas**
   (a) Bacteriological Dry-Weather Runoff Gutter Study (Phase III)
   (b) Prop 84 ASBS Grant Program
   (c) Big Canyon Project
   (d) Rhine Channel Project Wrap Up
   (e) Senate Bill – SB 1447

   Set Next Meeting Date
   The next meeting date was set for June 13, 2013, at 3 PM in the **Newport Coast Meeting Room**

7. **Adjournment**
   The meeting was adjourned at 4:45 pm.

Chairwoman / Nancy Gardner

Health Care Agency / Environmental Health Newport Bay Bacteriological Monitoring Program
Total Coliform (TC), Fecal Coliform, Enterococcus (ENT) Colony Forming Units / 100 ml Sample

STATION	Location Description		1/7/13	1/14/13	1/22/13	1/28/13	2/4/13	2/13/13	2/20/13	2/25/13	3/6/13	3/11/13	3/18/13	3/25/13	4/3/13	4/8/13	4/17/13	4/22/13	4/29/13	5/6/13
NEWPORT BAY (Lower Bay)						RAIN						RAIN								RAIN
BNB09	43rd Street Beach	TC	<10	<10	10	>70	50	30	50	40	<10	70	20	70	>3800	30	>80	100	30	>40000
		FC	<10	<10	<10	10	<10	<10	10	<10	<10	10	10	<10	300	10	<10	60	10	11000
		ENT	4	<2	2	<2	<10	2	10	4	<2	<2	<2	218	20	8	10	98	10	400
BNB10	38th Street Beach	TC	230	20	30	80	<10	10	50	80	60	30	<10	10	30	30	20	20	270	11000
		FC	10	<10	10	10	<10	<10	<10	30	<10	<10	<10	<10	<10	<10	<10	<10	10	1870
		ENT	52	4	10	6	10	8	2	44	38	6	2	2	6	<2	2	2	<2	140
BNB11	33rd Street Channel	TC	4200	360	100	100	20	20	28000	50	30	20	80	100	30	10	40	30	95	1620
		FC	40	<10	10	<10	<10	10	840	<10	<10	<10	30	<10	<10	<10	<10	<10	<10	250
		ENT	72	10	20	<2	4	8	350	6	4	<2	20	8	<2	4	<2	4	<2	50
BNB32	Lido Yacht Club Beach	TC	10	<10	<10	>490	80	<10	20	40	10	50	10	<10	<10	>50	<10	<10	80	30
		FC	<10	10	<10	<10	10	<10	<10	10	<10	<10	20	<10	<10	<10	<10	<10	30	<10
		ENT	10	<2	90	4	2	6	2	100	<2	<2	2	<2	4	<2	<2	<2	<2	20
BNB07	Via Genoa Beach	TC	<10	10	<10	>710	30	10	250	<10	<10	20	70	<10	10	>70	<10	30	10	40
		FC	<10	<10	10	100	20	10	60	<10	<10	10	20	<10	<10	20	<10	<10	<10	10
		ENT	2	4	6	10	2	<2	60	6	<2	2	20	4	2	20	2	2	2	<2
BNB35	Newport Blvd. Bridge	TC	9600	330	>19000	>1390	>40000	340	>40000	<10	40000	120	>40000	170	>40000	330	>1030	240	8000	40000
		FC	4200	<10	5000	100	1100	70	>40000	<10	23600	<10	95	60	900	<10	310	20	50	12000
		ENT	1000	78	3800	>180	1000	10	23800	<2	6200	2	150	20	800	8	140	44	110	8200
BNB12	Rhine Channel	TC	40	20	210	>250	20	20	120	<10	<10	30	70	<10	60	30	20	30	60	4400
		FC	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	10	<10	<10	20	<10	<10	<10	490
		ENT	<2	<2	<2	2	<2	2	<2	<2	<10	2	<2	<2	8	<2	<2	<2	8	140
BNB14	19th Street Beach	TC	60	20	<10	>640	30	70	<10	<10	<10	>110	<10	10	40	>20	<10	<10	10	80
		FC	10	10	<10	30	<10	<10	<10	<10	<10	10	<10	<10	30	<10	<10	<10	<10	<10
		ENT	20	24	4	4	4	8	2	<2	<2	<2	2	<2	>2	8	2	2	<2	2
BNB15	15th Street Beach	TC	20	30	20	>320	<10	<10	100	10	10	20	<10	<10	580	10	95	110	30	480
		FC	<10	<10	<10	30	<10	<10	<10	<10	<10	<10	<10	<10	140	<10	80	95	20	130
		ENT	4	2	6	2	<2	<2	10	<2	2	2	140	<2	<2	4	2	8	<2	110
BNB17	10th Street Beach	TC	20	<10	120	>430	95	<10	40	<10	<10	50	10	<10	50	>10	<10	30	<10	10
		FC	<10	10	50	250	40	<10	20	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10
		ENT	<2	10	6	236	6	10	10	<2	<2	4	<2	<2	<2	4	<2	<2	4	4
BNB18	Alvarado/ Bay Isle Beach	TC	100	20	100	>920	10	30	20	20	70	110	10	10	<10	>320	<10	10	<10	40
		FC	20	<10	10	95	10	<10	<10	10	10	<10	<10	10	<10	360	<10	<10	<10	<10
		ENT	88	6	1000	6	4	10	78	8	329	2	<2	<2	4	26	2	4	2	8
BNB22	N Street Beach	TC	10	10	<10	250	30	<10	10	<10	10	<10	<10	<10	20	10	<10	<10	<10	10
		FC	<10	<10	<10	30	10	10	<10	<10	<10	<10	10	<10	30	<10	10	<10	<10	<10
		ENT	4	<2	<2	<2	4	<2	4	<2	6	<2	<2	<2	2	2	2	<2	<2	<2
BNB31	Garnet Avenue Beach	TC	50	10	40	>880	80	<10	50	30	40	180	10	10	460	>10	<10	10	>20	30
		FC	60	<10	10	30	<10	10	50	<10	<9	<10	<10	10	410	<10	<10	10	10	<10
		ENT	24	2	2	8	6	8	100	<2	3	2	20	<2	20	2	<2	22	10	2
BNB03	Ruby Avenue Beach	TC	10	<10	<10	>580	50	10	10	<10	9	100	<10	10	30	>70	<10	10	10	120
		FC	10	<10	<10	70	<10	10	<10	<10	9	<10	10	<10	<10	10	<10	<10	<10	30
		ENT	4	<2	<2	190	<2	10	10	2	2	6	<2	2	<2	52	<2	6	10	10
BNB20	Sapphire Avenue Beach	TC	20	10	20	>460	30	20	20	<10	9	10	40	10	30	>10	<10	10	100	30
		FC	<10	<10	<10	20	10	20	<10	<10	9	<10	40	10	10	<10	<10	10	20	20
		ENT	<2	2	<2	4	4	2	<2	<2	<2	4	<2	4	<2	4	10	2	4	<2
BNB34	Grand Canal	TC	190	20	95	>560	130	60	860	<10	990	20	380	<10	20	20	30	10	10	450
		FC	180	<10	110	30	120	50	<10	<10	440	10	260	<10	20	20	<10	<10	<10	50
		ENT	22	2	<2	<2	68	20	42	<2	226	<2	20	2	42	4	4	8	<2	64
BNB21	Abalone Avenue Beach	TC	30	<10	150	>300	10	30	80	<10	90	160	30	80	100	100	>140	100	20	100
		FC	<10	<10	130	20	20	<10	<10	<10	20	70	30	50	130	40	80	100	<10	50
		ENT	<2	2	10	6	2	10	10	<2	10	4	<2	10	72	24	68	28	2	10
BNB01	Park Avenue Beach	TC	10	20	<10	>690	40	<10	70	130	9	50	20	40	20	10	20	30	10	>580
		FC	10	<10	<10	30	<10	10	<10	<10	<9	<10	<10	10	<10	<10	<10	10	<10	40
		ENT	2	<2	2	<2	2	2	8	<2	3	<2	<2	<2	<2	<2	<2	2	2	42
BNB02	Onyx Avenue Beach	TC	130	10	80	>850	<10	40	10	40	<10	190	10	<10	10	160	10	70	40	270
		FC	10	10	<10	160	<10	20	10	<10	<10	10	<10	<10	<10	95	<10	10	30	20
		ENT	10	4	20	22	2	4	20	6	2	6	<2	4	10	120	10	20	2	26
BNB29	Promontory Point Channel	TC	<10	20	<10	>670	>40000	<10	20	<10	<10	20	10	<10	<10	<10	<10	40	<10	50
		FC	<10	<10	<10	20	20	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
		ENT	<2	<2	<2	20	<2	2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	10
BNB33	Bayside Drive Beach	TC	<10	60	30	100	>100	10	130	60	30	20	150	30	>270	>260	10	60	60	6000
		FC	<10	<10	<10	<10	30	<10	40	40	<10	20	60	<10	60	160	10	10	60	510
		ENT	<2	6	2	<2	4	6	6	2	2	<2	20	<2	42	40	<2	10	42	2000
BNB23	Rocky Point Beach	TC	<10	10	<10	30	<10	110	60	<10	<10	<10	<10	<10	20	<10	20	>10	<10	10
		FC	<10	<10	<10	20	10	40	<10	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	10
		ENT	<2	<2	4	2	<2	6	10	<2	<2	<2	<2	<2	10	<2	<2	4	4	<2

NS - NOT SAMPLED
LA - LAB ACCIDENT
Cw/(o)C- CONFLUENT GROWTH
WITH(OUT) COLIFORMS
TNTC - TOO NUMEROUS TO COUNT

SINGLE SAMPLE STANDARDS:
Total Coliforms - 10,000 organisms per 100 milliliters sample.
Fecal Coliforms - 400 organisms per 100 milliliters sample.
Enterococci - 104 organisms per 100 milliliters sample.
Fecal:Total Ratio - >1000 total coliforms if ratio exceeds 0.1.

New Data
Single Sample Standard Violation.
Long-term Posting Location.
Creek/Drain Sample Location.
Rain Influenced Data.

30-DAY LOG MEAN STANDARDS (of five weekly samples)
Total Coliforms - 1,000 organisms per 100 milliliters sample.
Fecal Coliforms - 200 organisms per 100 milliliters sample.
Enterococci - 35 organisms per 100 milliliters sample.

ORANGE COUNTY

OC Public Works

Our Community. Our Commitment.

Proposed Countywide Adopt a Channel Program

Presented to the
City of Newport Beach
Water Quality/Coastal Tidelands Committee

Kim Buss & Jenna Voss
County of Orange
May 9, 2013

Overview

- Background
- Other successful adoption models
  - CalTrans
  - OC Parks
- Pilot Adopt a Channel Program
- Transition to a Countywide Adopt a Channel Program
  - Adoption Prototypes
  - Trash & Debris Booms
  - Benefits

OC Public Works

Water Resource Stewards

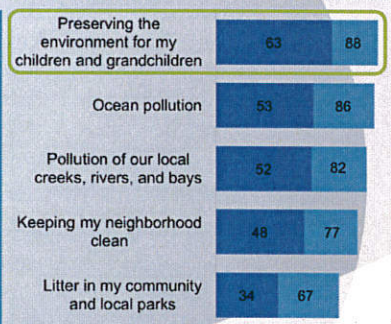
There is not a "fragment" in all nature, for every relative fragment of one thing is a full harmonious unit in itself.

- John Muir (A Thousand Mile Walk to the Gulf, 1916)

Our Water Future

A survey conducted in 2012 asked Orange County residents to rank in importance to them several environmental priorities

Preserving a legacy for future generations is very important; however, this is tied to preventing pollution, and keeping neighborhoods clean.



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Our Water Future

- **Making Progress:** Water quality at beaches in Orange County this past summer was excellent overall with 93% of beaches receiving an A grade (*2012 Heal the Bay Report Card*).
- **Many Remaining Challenges:** Trash & debris and other pollutants

Successful "Adoption" Format

- CalTrans Adopt-A-Highway
  - **Adoption elements:** Litter removal, graffiti removal, vegetation control, tree & wildflower planting
  - **Program benefits:** Pollution source control, aesthetically improved roadsides and promotion of community pride
  - **Volunteer benefits:** Courtesy sign recognizing participants
  - From July 2009 through June 2010, participants collected nearly 16,741 yd^3 of litter from roadsides, saving $11,280,000 in maintenance costs

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Successful "Adoption" Format

- OC Parks Adopt-A-Park
  - Volunteer activities: greeting visitors at nature centers, park administrative assistance, photo documenting park lands, tree planting and seeding, presenting environmental education programs, building/repairing nesting boxes, building/repairing trails

Genesis of Adopt a Channel

OC PublicWorks

Genesis of Adopt a Channel

Municipal Activities

- Litter enforcement
- Street sweeping
- Catch basin and channel cleaning
- Graffiti removal
- Booms, screens and other structural devices

Genesis of Adopt a Channel

Volunteer Cleanup Events

- Annual Inner-Coastal Cleanup Day throughout the County in coordination with other organizations = 9,000 volunteers in one day
- Recent increase in the number of small-scale scheduled cleanup events throughout the year under staff supervision and use of individual liability waiver forms;
- Through encroachment permits where fees are waived

OC PublicWorks

Genesis of Adopt a Channel

- **July 2010**: Disneyland Resort approaches OC Public Works to adopt a segment of Anaheim-Barber City Channel
- **August 2010:** Adoption Work Group formed to compose program work plan
- **June 2012**: Agreement approved by Board of Supervisors
- **August 2012:** Trash and graffiti removal begins

Adopt a Channel

OC PublicWorks

Pilot Adoption Goals

- Inspect channels on a more regular basis
  - Minimum bimonthly basis
- Remove trash and debris on a regular basis
  - As needed based on inspections
- Remove graffiti on a more regular basis
  - As needed based on inspections
- Increase visibility and promote stewardship of channels and other waterways
  - Everyday

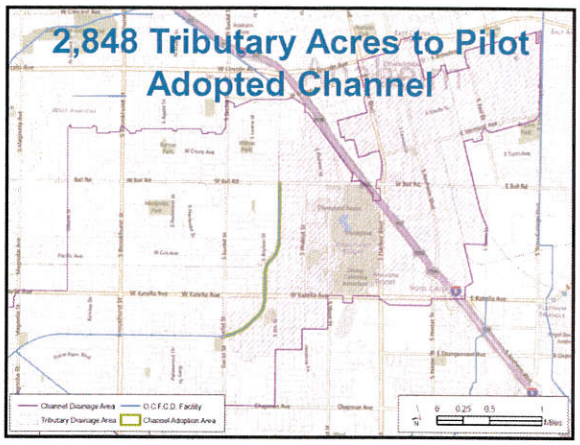
OC PublicWorks

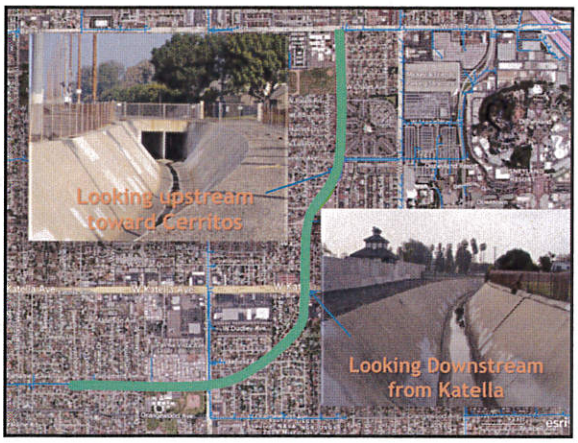
Pilot Adoption Implementation

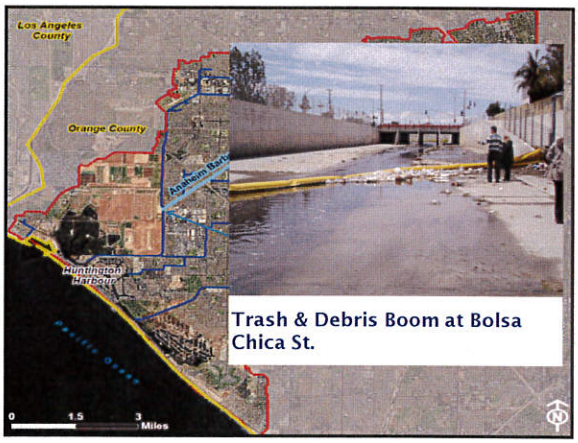
- Agreement with Disneyland Resort for a pilot adoption of 2 miles of Anaheim Barber City Channel approved by the Board of Supervisors on June 19, 2012
- Orange County Conservation Corps (OCCC)
  - Weekly inspection/maintenance performed
  - 402 lbs. of trash/debris removed/disposed of in the first six months
  - 5,480 ft² of graffiti abatement in the first six months and participation in the Sheriff's TAGRS Program
  - The cost of adopting a mile of concrete channel estimated to be $500-$750/month for trash and graffiti removal

OC PublicWorks

2,848 Tributary Acres to Pilot Adopted Channel







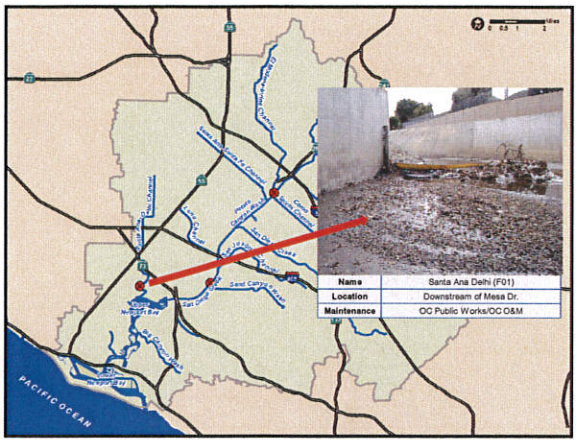
Adoption Prototypes

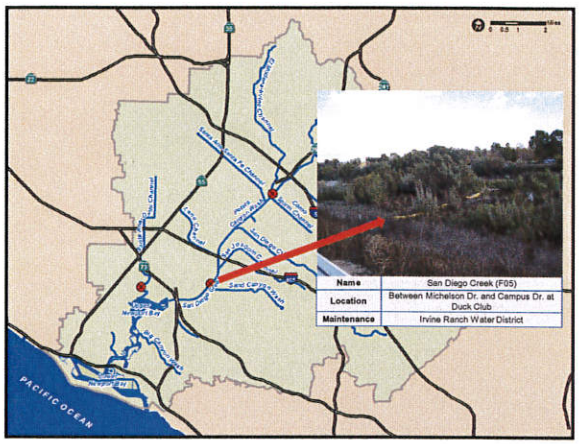
- Concrete-lined Channels*
  - Corporate adoption of Concrete-lined channels (current pilot program format)
  - Non-profit/volunteer-based adoption of Concrete-lined channels
- Earthen-bottom/Rip-rap Channels*
  - Corporate adoption of earthen channels
  - Non-profit/volunteer-based adoption of earthen channels

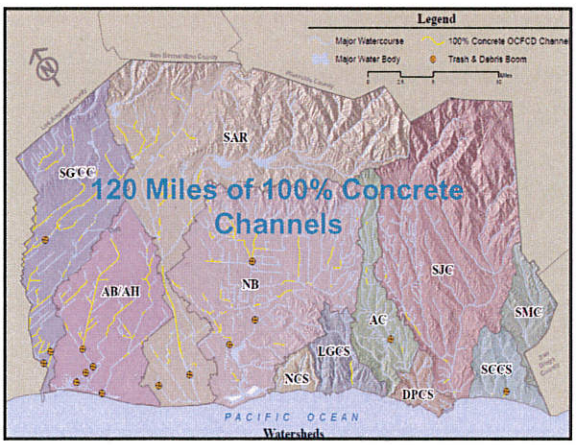
*May include trash and debris booms

OC PublicWorks

Trash & Debris Booms







Potential Adopter Benefits

- Signage
  - Adopt-A-Highway model
  - Educational information about the watersheds
  - Signs placed at publicly visible locations
- Use of logo on correspondence
  - Show organization support of Program on letters, email, social media, etc.
- Website recognition
  - Establish a dedicated page for Adopt A Channel Program and adopters – link from organization websites to www.ocwatersheds.com

OC Public Works

Potential Program Marketing

- Earned Media Potential
  - Work with local media outlets
- OC Stormwater Program
  - Link from OC Stormwater web pages and social media to highlight stewardship
- Website Linking
  - County, OC Stormwater and adopting organizations all cross-link list of adopters and efforts to keep channels clean

OC Public Works

Questions?

OC Public Works

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Our Community. Our Commitment.

Thank You!

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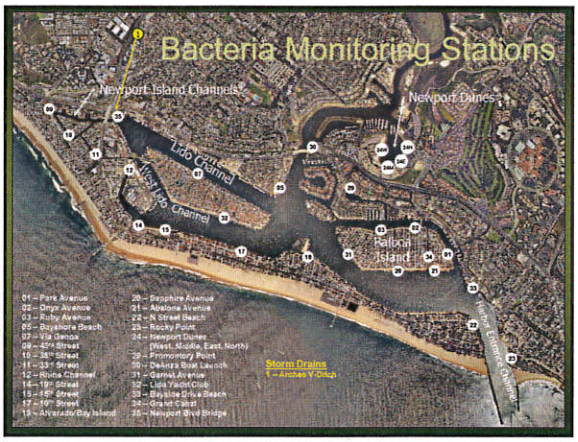
City of Newport Beach Arches WQ Improvement Project

John Kappeler
City of Newport Beach
May 9th, 2013

Newport Harbor



Background

- Weekly bacteria monitoring in Newport Bay shows frequent AB411 violations
- The only location (currently) in lower Newport Bay not meeting Fecal Coliform TMDL standards
- Long term posting in place at this location – **1999**
- 2004 completed an intensive flow and water quality monitoring project
- Numerous Best Management Practice (BMPs) installed in the watershed

Flow & WQ Monitoring Project

Flow & WQ Monitoring Project




Flow & WQ Monitoring Project Results

Arches V-Ditch

- Average Flow (gpd) – 30,000
- Total Coliform – 15,138
- Fecal Coliform – 997
- Enterococcus - 547

Arches Outfall

- Concentrations are 1-2 orders lower, but still exceed standards

Watershed BMPs

- Bioswale
- CDS Units
- Catch Basin Screens
- Lions Park Detention Basin
- West Side Coast Mesa Development
- Pump Out Station Inspection Program
- Street Sweeping & Catch Basin Cleaning

Watershed BMPs



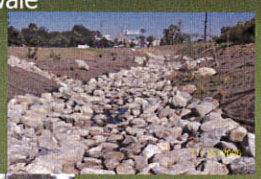
Watershed BMPs

Bioswale




Watershed BMPs

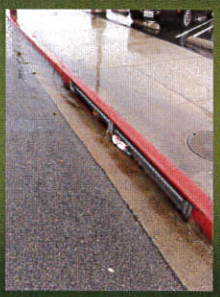
Bioswale


Watershed BMPs
CDS Units


Watershed BMPs
Catch Basin Screens

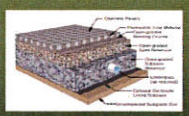
Installation of 115 ARS catch basin screens in this sub-watershed

Watershed BMPs
Lions Park Detention Basin

Watershed BMPs
West Side Costa Mesa Development

Redeveloped approximately 15 acres with new LID requirements in the effected sub-watershed


Watershed BMPs
Pump Out Station Inspection Program

Watershed BMPs
Street Sweeping & Catch Basin Cleaning


Next Steps?

- Step 1: Focus on the Arches storm drain outfall
- Step 2: Assess bacterial contributions from the bioswale, and (CDS) Units
- Step 3: Conduct watershed-wide Microbial Source Tracking Study (MST)

Step 1:

- Determine bacterial loading from outfall
- Assess bacterial contributions from biofilm in outfall
- Investigate other bacterial sources related to the marina

Step 2:

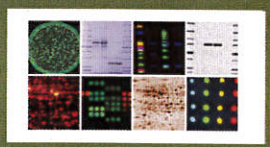
Assess Bacterial Contributions from Bioswale and CDS Units

- Bioswale and CDS units may serve as biofilm "media" allowing bacteria to accumulate and regrow
- This study will determine bacterial contributions from bioswale and CDS units

Step 3:

Conduct watershed-wide Microbial Source Tracking Study (MST)

- MST investigations involve using field and laboratory methods to identify potential sources of bacteria to waterbodies.



Step 3:

Estimated Study Costs

1. Arches Drain Outfall & Marina	**$20,000**
2. Arches Drain Bioswale & CDS	$10,000
3. Arches Watershed Microbial Source Tracking Study	$250,000 - $300,000

Thank You

AB 411 Criteria

- Long-term Average
  - 30-day geometric mean (minimum 5 weekly samples)
  - Total Coliform 1,000 CFU/100 mL
  - Fecal Coliform 200 CFU/100 mL
  - Enterococcus 35 CFU/100 mL
- Single Sample
  - Total Coliform 10,000 CFU/100 mL
  - Fecal Coliform 400 CFU/100 mL
  - Enterococcus 104 CFU/100 mL
  - FC/TC > 0.1 TC>1,000 CFU/100 mL